



SEQUENCE LISTING

<110> AFEYAN, NOUBAR B.  
LEE, FRANK D.  
WONG, GORDON G.  
DAS GUPTA, RUCHIRA  
BAYNES, BRIAN

<120> ADZYMES AND USES THEREOF

<130> COTH-P01-001

<140> 10/650,592

<141> 2003-08-27

<150> 60/406,517

<151> 2002-08-27

<150> 60/423,754

<151> 2002-11-05

<150> 60/430,001

<151> 2002-11-27

<160> 45

<170> PatentIn version 3.5

<210> 1

<211> 12

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: Synthetic  
peptide

<400> 1

Glu Glu Thr Ala Arg Phe Gln Pro Gly Tyr Arg Ser  
1 5 10

<210> 2

<211> 10

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: Synthetic  
peptide

<400> 2

Glu Gln Lys Leu Ile Ser Glu Glu Asp Leu  
1 5 10

<210> 3

<211> 7  
<212> PRT  
<213> Artificial Sequence

<220>  
<223> Description of Artificial Sequence: Synthetic  
peptide

<400> 3  
Asp Tyr Lys Asp Asp Asp Lys  
1 5

<210> 4  
<211> 9  
<212> PRT  
<213> Artificial Sequence

<220>  
<223> Description of Artificial Sequence: Synthetic  
peptide

<400> 4  
Tyr Pro Tyr Asp Val Pro Asp Tyr Ala  
1 5

<210> 5  
<211> 12  
<212> PRT  
<213> Artificial Sequence

<220>  
<223> Description of Artificial Sequence: Synthetic  
peptide

<400> 5  
Glu Asp Gln Val Asp Pro Arg Leu Ile Asp Gly Lys  
1 5 10

<210> 6  
<211> 11  
<212> PRT  
<213> Artificial Sequence

<220>  
<223> Description of Artificial Sequence: Synthetic  
peptide

<400> 6  
Tyr Thr Asp Ile Glu Met Asn Arg Leu Gly Lys  
1 5 10

<210> 7  
<211> 5

<212> PRT  
<213> Artificial Sequence

<220>  
<223> Description of Artificial Sequence: Synthetic  
peptide

<400> 7  
Ser Ser Ser Ser Gly  
1 5

<210> 8  
<211> 5  
<212> PRT  
<213> Artificial Sequence

<220>  
<223> Description of Artificial Sequence: Synthetic  
peptide

<400> 8  
Ser Gly Gly Gly Gly  
1 5

<210> 9  
<211> 5  
<212> PRT  
<213> Artificial Sequence

<220>  
<223> Description of Artificial Sequence: Synthetic  
peptide

<220>  
<221> MOD\_RES  
<222> (3)..(4)  
<223> Any amino acid

<400> 9  
His Glu Xaa Xaa His  
1 5

<210> 10  
<211> 6  
<212> PRT  
<213> Artificial Sequence

<220>  
<223> Description of Artificial Sequence: Synthetic  
6x His tag

<400> 10  
His His His His His His

1

5

<210> 11

<211> 26

<212> PRT

<213> Human immunodeficiency virus 1

<400> 11

Cys Phe Ile Thr Lys Ala Leu Gly Ile Ser Tyr Gly Arg Lys Lys Arg  
1 5 10 15

Arg Gln Arg Arg Arg Pro Pro Gln Gly Ser  
20 25

<210> 12

<211> 12

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: Synthetic  
peptide

<400> 12

Cys Met His Ile Glu Ser Leu Asp Ser Tyr Thr Cys  
1 5 10

<210> 13

<211> 12

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: Synthetic  
peptide

<400> 13

Cys Met Tyr Ile Glu Ala Leu Asp Lys Tyr Ala Cys  
1 5 10

<210> 14

<211> 32

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: Synthetic  
peptide

<220>

<221> MOD\_RES

<222> (1)..(1)  
<223> A unique residue, such as cysteine or lysine, that facilitates chemical conjugation of the internalizing peptide to a targeting protein conjugate

<220>  
<221> MOD\_RES  
<222> (2)..(3)  
<223> Any residues selected to modulate the affinity of the internalizing peptide for different membranes

<220>  
<223> see specification as filed for detailed description of substitutions and preferred embodiments

<400> 14  
Xaa Xaa Xaa Glu Ala Ala Leu Ala Glu Ala Leu Ala Glu Ala Leu Ala  
1 5 10 15

Glu Ala Leu Ala Glu Ala Leu Ala Glu Ala Leu Glu Ala Leu Ala Ala  
20 25 30

<210> 15  
<211> 7  
<212> PRT  
<213> Artificial Sequence

<220>  
<223> Description of Artificial Sequence: Synthetic peptide

<400> 15  
Ala Leu Trp His Trp Trp His  
1 5

<210> 16  
<211> 7  
<212> PRT  
<213> Artificial Sequence

<220>  
<223> Description of Artificial Sequence: Synthetic peptide

<220>  
<221> MOD\_RES  
<222> (1)..(1)  
<223> Thr or Ser

<400> 16  
Xaa Trp Leu His Trp Trp Ala  
1 5

<210> 17  
<211> 5  
<212> PRT  
<213> Artificial Sequence

<220>  
<223> Description of Artificial Sequence: Synthetic  
peptide

<400> 17  
Gly Gly Gly Gly Ser  
1 5

<210> 18  
<211> 6  
<212> PRT  
<213> Influenza A virus

<400> 18  
Asp Val Pro Asp Tyr Ala  
1 5

<210> 19  
<211> 15  
<212> PRT  
<213> Artificial Sequence

<220>  
<223> Description of Artificial Sequence: Synthetic  
peptide

<400> 19  
Gly Gly Gly Gly Ser Gly Gly Gly Gly Ser Gly Gly Gly Gly Ser  
1 5 10 15

<210> 20  
<211> 4  
<212> PRT  
<213> Artificial Sequence

<220>  
<223> Description of Artificial Sequence: Synthetic  
peptide

<400> 20  
Gly Gly Val Arg  
1

<210> 21  
<211> 639  
<212> PRT  
<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: Synthetic  
polypeptide

<400> 21

Met Glu Thr Asp Thr Leu Leu Leu Trp Val Leu Leu Leu Trp Val Pro  
1 5 10 15

Gly Ser Thr Gly Asp Ala Ala Gln Pro Ala Arg Arg Ala Val Arg Ser  
20 25 30

Leu Met Thr Ala Thr Ser Glu Tyr Gln Thr Phe Phe Asn Pro Arg Thr  
35 40 45

Phe Gly Ser Gly Glu Ala Asp Cys Gly Leu Arg Pro Leu Phe Glu Lys  
50 55 60

Lys Ser Leu Glu Asp Lys Thr Glu Arg Glu Leu Leu Glu Ser Tyr Ile  
65 70 75 80

Asp Gly Arg Ile Val Glu Gly Ser Asp Ala Glu Ile Gly Met Ser Pro  
85 90 95

Trp Gln Val Met Leu Phe Arg Lys Ser Pro Gln Glu Leu Leu Cys Gly  
100 105 110

Ala Ser Leu Ile Ser Asp Arg Trp Val Leu Thr Ala Ala His Cys Leu  
115 120 125

Leu Tyr Pro Pro Trp Asp Lys Asn Phe Thr Glu Asn Asp Leu Leu Val  
130 135 140

Arg Ile Gly Lys His Ser Arg Thr Arg Tyr Glu Arg Asn Ile Glu Lys  
145 150 155 160

Ile Ser Met Leu Glu Lys Ile Tyr Ile His Pro Arg Tyr Asn Trp Arg  
165 170 175

Glu Asn Leu Asp Arg Asp Ile Ala Leu Met Lys Leu Lys Lys Pro Val  
180 185 190

Ala Phe Ser Asp Tyr Ile His Pro Val Cys Leu Pro Asp Arg Glu Thr  
195 200 205

Ala Ala Ser Leu Leu Gln Ala Gly Tyr Lys Gly Arg Val Thr Gly Trp  
210 215 220

Gly Asn Leu Lys Glu Thr Trp Thr Ala Asn Val Gly Lys Gly Gln Pro  
225 230 235 240

Ser Val Leu Gln Val Val Asn Leu Pro Ile Val Glu Arg Pro Val Cys  
245 250 255

Lys Asp Ser Thr Arg Ile Arg Ile Thr Asp Asn Met Phe Cys Ala Gly  
260 265 270

Tyr Lys Pro Asp Glu Gly Lys Arg Gly Asp Ala Cys Glu Gly Asp Ser  
275 280 285

Gly Gly Pro Phe Val Met Lys Ser Pro Phe Asn Asn Arg Trp Tyr Gln  
290 295 300

Met Gly Ile Val Ser Trp Gly Glu Gly Cys Asp Arg Asp Gly Lys Tyr  
305 310 315 320

Gly Phe Tyr Thr His Val Phe Arg Leu Lys Lys Trp Ile Gln Lys Val  
325 330 335

Ile Asp Gln Phe Gly Glu Gly Gly Gly Gly Ser Gly Gly Gly Gly Ser  
340 345 350

Gly Gly Gly Gly Ser Met Glu Val Gln Leu Leu Glu Ser Gly Gly Asp  
355 360 365

Leu Val Lys Pro Gly Gly Ser Leu Lys Leu Ser Cys Ala Ala Ser Gly  
370 375 380

Phe Thr Phe Ser Thr Tyr Gly Met Ser Trp Val Arg Gln Thr Pro Asp  
385 390 395 400

Lys Arg Leu Glu Trp Val Ala Thr Ile Ser Asn Gly Gly Gly Tyr Thr  
405 410 415

Tyr Tyr Pro Asp Ser Val Lys Gly Arg Phe Thr Ile Ser Arg Asp Asn  
420 425 430



Ala Lys Asn Thr Leu Tyr Leu Gln Met Ser Ser Leu Lys Ser Glu Asp  
435 440 445

Thr Ala Met Tyr Tyr Cys Ala Arg Arg Glu Arg Tyr Asp Glu Asn Gly  
450 455 460

Phe Ala Tyr Trp Gly Arg Gly Thr Leu Val Thr Val Ser Ala Gly Gly  
465 470 475 480

Gly Gly Ser Gly Gly Gly Gly Ser Gly Gly Gly Gly Ser Asp Ile Val  
485 490 495

Met Ser Gln Ser Pro Ser Ser Leu Ala Val Ser Val Gly Glu Lys Ile  
500 505 510

Thr Met Ser Cys Lys Ser Ser Gln Ser Leu Phe Asn Ser Gly Lys Gln  
515 520 525

Lys Asn Tyr Leu Thr Trp Tyr Gln Gln Lys Pro Gly Gln Ser Pro Lys  
530 535 540

Leu Leu Ile Tyr Trp Ala Ser Thr Arg Glu Ser Gly Val Pro Asp Arg  
545 550 555 560

Phe Thr Gly Ser Gly Ser Gly Thr Asp Phe Thr Leu Thr Ile Ser Ser  
565 570 575

Val Lys Ala Glu Asp Leu Ala Val Tyr Tyr Cys Gln Asn Asp Tyr Ser  
580 585 590

His Pro Leu Thr Phe Gly Gly Gly Thr Lys Leu Glu Ile Lys Arg Ala  
595 600 605

Asp Ala Ala Pro Thr Ala Arg Gly Gly Pro Glu Gln Lys Leu Ile Ser  
610 615 620

Glu Glu Asp Leu Asn Ser Ala Val Asp His His His His His His  
625 630 635

<210> 22

<211> 639

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: Synthetic  
polypeptide

<400> 22

Met Glu Thr Asp Thr Leu Leu Leu Trp Val Leu Leu Leu Trp Val Pro  
1 5 10 15

Gly Ser Thr Gly Asp Ala Ala Gln Pro Ala Arg Arg Ala Val Arg Ser  
20 25 30

Leu Met Glu Val Gln Leu Leu Glu Ser Gly Gly Asp Leu Val Lys Pro  
35 40 45

Gly Gly Ser Leu Lys Leu Ser Cys Ala Ala Ser Gly Phe Thr Phe Ser  
50 55 60

Thr Tyr Gly Met Ser Trp Val Arg Gln Thr Pro Asp Lys Arg Leu Glu  
65 70 75 80

Trp Val Ala Thr Ile Ser Asn Gly Gly Gly Tyr Thr Tyr Tyr Pro Asp  
85 90 95

Ser Val Lys Gly Arg Phe Thr Ile Ser Arg Asp Asn Ala Lys Asn Thr  
100 105 110

Leu Tyr Leu Gln Met Ser Ser Leu Lys Ser Glu Asp Thr Ala Met Tyr  
115 120 125

Tyr Cys Ala Arg Arg Glu Arg Tyr Asp Glu Asn Gly Phe Ala Tyr Trp  
130 135 140

Gly Arg Gly Thr Leu Val Thr Val Ser Ala Gly Gly Gly Gly Ser Gly  
145 150 155 160

Gly Gly Gly Ser Gly Gly Gly Gly Ser Asp Ile Val Met Ser Gln Ser  
165 170 175

Pro Ser Ser Leu Ala Val Ser Val Gly Glu Lys Ile Thr Met Ser Cys  
180 185 190

Lys Ser Ser Gln Ser Leu Phe Asn Ser Gly Lys Gln Lys Asn Tyr Leu  
195 200 205

Thr Trp Tyr Gln Gln Lys Pro Gly Gln Ser Pro Lys Leu Leu Ile Tyr  
 210 215 220

Trp Ala Ser Thr Arg Glu Ser Gly Val Pro Asp Arg Phe Thr Gly Ser  
 225 230 235 240

Gly Ser Gly Thr Asp Phe Thr Leu Thr Ile Ser Ser Val Lys Ala Glu  
 245 250 255

Asp Leu Ala Val Tyr Tyr Cys Gln Asn Asp Tyr Ser His Pro Leu Thr  
 260 265 270

Phe Gly Gly Gly Thr Lys Leu Glu Ile Lys Arg Ala Asp Ala Ala Pro  
 275 280 285

Thr Gly Gly Gly Gly Ser Gly Gly Gly Gly Ser Gly Gly Gly Gly Ser  
 290 295 300

Met Thr Ala Thr Ser Glu Tyr Gln Thr Phe Phe Asn Pro Arg Thr Phe  
 305 310 315 320

Gly Ser Gly Glu Ala Asp Cys Gly Leu Arg Pro Leu Phe Glu Lys Lys  
 325 330 335

Ser Leu Glu Asp Lys Thr Glu Arg Glu Leu Leu Glu Ser Tyr Ile Asp  
 340 345 350

Gly Arg Ile Val Glu Gly Ser Asp Ala Glu Ile Gly Met Ser Pro Trp  
 355 360 365

Gln Val Met Leu Phe Arg Lys Ser Pro Gln Glu Leu Leu Cys Gly Ala  
 370 375 380

Ser Leu Ile Ser Asp Arg Trp Val Leu Thr Ala Ala His Cys Leu Leu  
 385 390 395 400

Tyr Pro Pro Trp Asp Lys Asn Phe Thr Glu Asn Asp Leu Leu Val Arg  
 405 410 415

Ile Gly Lys His Ser Arg Thr Arg Tyr Glu Arg Asn Ile Glu Lys Ile  
 420 425 430

Ser Met Leu Glu Lys Ile Tyr Ile His Pro Arg Tyr Asn Trp Arg Glu

435	440	445
Asn Leu Asp Arg Asp Ile Ala Leu Met Lys Leu Lys Lys Pro Val Ala		
450	455	460
Phe Ser Asp Tyr Ile His Pro Val Cys Leu Pro Asp Arg Glu Thr Ala		
465	470	475 480
Ala Ser Leu Leu Gln Ala Gly Tyr Lys Gly Arg Val Thr Gly Trp Gly		
	485	490 495
Asn Leu Lys Glu Thr Trp Thr Ala Asn Val Gly Lys Gly Gln Pro Ser		
	500	505 510
Val Leu Gln Val Val Asn Leu Pro Ile Val Glu Arg Pro Val Cys Lys		
	515	520 525
Asp Ser Thr Arg Ile Arg Ile Thr Asp Asn Met Phe Cys Ala Gly Tyr		
	530	535 540
Lys Pro Asp Glu Gly Lys Arg Gly Asp Ala Cys Glu Gly Asp Ser Gly		
545	550	555 560
Gly Pro Phe Val Met Lys Ser Pro Phe Asn Asn Arg Trp Tyr Gln Met		
	565	570 575
Gly Ile Val Ser Trp Gly Glu Gly Cys Asp Arg Asp Gly Lys Tyr Gly		
	580	585 590
Phe Tyr Thr His Val Phe Arg Leu Lys Lys Trp Ile Gln Lys Val Ile		
	595	600 605
Asp Gln Phe Gly Glu Ala Arg Gly Gly Pro Glu Gln Lys Leu Ile Ser		
	610	615 620
Glu Glu Asp Leu Asn Ser Ala Val Asp His His His His His His		
625	630	635

<210> 23

<211> 30

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: Synthetic  
oligonucleotide

<400> 23  
cccggaagct taatggaggt gcagctgttg 30

<210> 24  
<211> 31  
<212> DNA  
<213> Artificial Sequence

<220>  
<223> Description of Artificial Sequence: Synthetic  
oligonucleotide

<400> 24  
acgcccctcg agcagttggt gcagcatcag c 31

<210> 25  
<211> 33  
<212> DNA  
<213> Artificial Sequence

<220>  
<223> Description of Artificial Sequence: Synthetic  
oligonucleotide

<400> 25  
cccggaagct taatgaccgc caccagtgag tac 33

<210> 26  
<211> 31  
<212> DNA  
<213> Artificial Sequence

<220>  
<223> Description of Artificial Sequence: Synthetic  
oligonucleotide

<400> 26  
ggcccctcga gcctctccaa actgatcaat g 31

<210> 27  
<211> 72  
<212> DNA  
<213> Artificial Sequence

<220>  
<223> Description of Artificial Sequence: Synthetic  
oligonucleotide

<400> 27  
tttgagagg gaggcgggtgg gtctggtggg ggcggtagtg gcggagggtgg gagcatggag 60

gtgcagctgt tg 72

<210> 28  
<211> 73  
<212> DNA  
<213> Artificial Sequence

<220>  
<223> Description of Artificial Sequence: Synthetic  
oligonucleotide

<400> 28  
cacctccatg ctccacctc cgccactacc gccccacca gaccaccgc ctccctctcc 60  
aaactgatca atg 73

<210> 29  
<211> 75  
<212> DNA  
<213> Artificial Sequence

<220>  
<223> Description of Artificial Sequence: Synthetic  
oligonucleotide

<400> 29  
gcaccaactg gaggcggtgg gtctggtggg ggcggtagtg gcggaggtgg gagcatgacc 60  
gccaccagtg agtac 75

<210> 30  
<211> 75  
<212> DNA  
<213> Artificial Sequence

<220>  
<223> Description of Artificial Sequence: Synthetic  
oligonucleotide

<400> 30  
ggtagcggtc atgctccac ctccgccact accgccccca ccagaccac cgcctccagt 60  
tggtgcagca tcagc 75

<210> 31  
<211> 33  
<212> PRT  
<213> Artificial Sequence

<220>  
<223> Description of Artificial Sequence: Synthetic  
peptide

<400> 31

Tyr Pro Tyr Asp Val Pro Asp Tyr Ala Ser Gly Ser Gly Ser Ser Gly  
1 5 10 15

Ser Gly Ser Ser Gly Ser Gly Ser Ser Gly Ser Gly Ser Gly Gly Val  
20 25 30

Arg

<210> 32

<211> 4

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: Synthetic  
peptide

<400> 32

Ile Thr Pro Arg

1

<210> 33

<211> 4

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: Synthetic  
peptide

<400> 33

Ile Thr Leu Arg

1

<210> 34

<211> 18

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: Synthetic  
peptide

<400> 34

Tyr Pro Tyr Asp Val Pro Asp Tyr Ala Gly Ser Gly Asp Tyr Lys Ala  
1 5 10 15

Phe Asp

<210> 35  
<211> 10  
<212> PRT  
<213> Artificial Sequence

<220>  
<223> Description of Artificial Sequence: Synthetic peptide

<400> 35  
Gly Gly Gly Gly Ser Gly Gly Gly Gly Ser  
1 5 10

<210> 36  
<211> 20  
<212> PRT  
<213> Artificial Sequence

<220>  
<223> Description of Artificial Sequence: Synthetic peptide

<400> 36  
Gly Gly Gly Gly Ser Gly Gly Gly Gly Ser Gly Gly Gly Gly Ser Gly  
1 5 10 15

Gly Gly Gly Ser  
20

<210> 37  
<211> 30  
<212> PRT  
<213> Artificial Sequence

<220>  
<223> Description of Artificial Sequence: Synthetic peptide

<400> 37  
Gly Gly Gly Gly Ser Gly Gly Gly Gly Ser Gly Gly Gly Gly Ser Gly  
1 5 10 15

Gly Gly Gly Ser Gly Gly Gly Gly Ser Gly Gly Gly Gly Ser  
20 25 30

<210> 38  
<211> 40  
<212> PRT  
<213> Artificial Sequence



<220>

<223> Description of Artificial Sequence: Synthetic peptide

<400> 38

Gly Gly Gly Gly Ser Gly Gly Gly Gly Ser Gly Gly Gly Gly Ser Gly  
1 5 10 15

Gly Gly Gly Ser Gly Gly Gly Gly Ser Gly Gly Gly Gly Ser Gly Gly  
20 25 30

Gly Gly Ser Gly Gly Gly Gly Ser  
35 40

<210> 39

<211> 50

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: Synthetic peptide

<400> 39

Gly Gly Gly Gly Ser Gly Gly Gly Gly Ser Gly Gly Gly Gly Ser Gly  
1 5 10 15

Gly Gly Gly Ser Gly Gly Gly Gly Ser Gly Gly Gly Gly Ser Gly Gly  
20 25 30

Gly Gly Ser Gly Gly Gly Gly Ser Gly Gly Gly Gly Ser Gly Gly Gly  
35 40 45

Gly Ser  
50

<210> 40

<211> 280

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: Synthetic polypeptide

<400> 40

Met Glu Thr Asp Thr Leu Leu Leu Trp Val Leu Leu Leu Trp Val Pro  
1 5 10 15

Gly Ser Thr Gly Asp Ile Ala Pro Phe Asp Asp Asp Asp Lys Ile Val  
20 25 30

Gly Gly Tyr Asn Cys Glu Glu Asn Ser Val Pro Tyr Gln Val Ser Leu  
35 40 45

Asn Ser Gly Tyr His Phe Cys Gly Gly Ser Leu Ile Asn Glu Gln Trp  
50 55 60

Val Val Ser Ala Gly His Cys Tyr Lys Ser Arg Ile Gln Val Arg Leu  
65 70 75 80

Gly Glu His Asn Ile Glu Val Leu Glu Gly Asn Glu Gln Phe Ile Asn  
85 90 95

Ala Ala Lys Ile Ile Arg His Pro Gln Tyr Asp Arg Lys Thr Leu Asn  
100 105 110

Asn Asp Ile Met Leu Ile Lys Leu Ser Ser Arg Ala Val Ile Asn Ala  
115 120 125

Arg Val Ser Thr Ile Ser Leu Pro Thr Ala Pro Pro Ala Thr Gly Thr  
130 135 140

Lys Cys Leu Ile Ser Gly Trp Gly Asn Thr Ala Ser Ser Gly Ala Asp  
145 150 155 160

Tyr Pro Asp Glu Leu Gln Cys Leu Asp Ala Pro Val Leu Ser Gln Ala  
165 170 175

Lys Cys Glu Ala Ser Tyr Pro Gly Lys Ile Thr Ser Asn Met Phe Cys  
180 185 190

Val Gly Phe Leu Glu Gly Gly Lys Asp Ser Cys Gln Gly Asp Ser Gly  
195 200 205

Gly Pro Val Val Cys Asn Gly Gln Leu Gln Gly Val Val Ser Trp Gly  
210 215 220

Asp Gly Cys Ala Gln Lys Asn Lys Pro Gly Val Tyr Thr Lys Val Tyr  
225 230 235 240

Asn Tyr Val Lys Trp Ile Lys Asn Thr Ile Ala Ala Asn Ser Thr Arg  
245 250 255

Gly Gly Pro Glu Gln Lys Leu Ile Ser Glu Glu Asp Leu Asn Ser Ala  
260 265 270

Val Asp His His His His His His  
275 280

<210> 41

<211> 461

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: Synthetic  
polypeptide

<400> 41

Met Glu Thr Asp Thr Leu Leu Leu Trp Val Leu Leu Leu Trp Val Pro  
1 5 10 15

Gly Ser Thr Gly Asp Ile Ala Pro Phe Asp Asp Asp Asp Lys Ile Val  
20 25 30

Gly Gly Tyr Asn Cys Glu Glu Asn Ser Val Pro Tyr Gln Val Ser Leu  
35 40 45

Asn Ser Gly Tyr His Phe Cys Gly Gly Ser Leu Ile Asn Glu Gln Trp  
50 55 60

Val Val Ser Ala Gly His Cys Tyr Lys Ser Arg Ile Gln Val Arg Leu  
65 70 75 80

Gly Glu His Asn Ile Glu Val Leu Glu Gly Asn Glu Gln Phe Ile Asn  
85 90 95

Ala Ala Lys Ile Ile Arg His Pro Gln Tyr Asp Arg Lys Thr Leu Asn  
100 105 110

Asn Asp Ile Met Leu Ile Lys Leu Ser Ser Arg Ala Val Ile Asn Ala  
115 120 125

Arg Val Ser Thr Ile Ser Leu Pro Thr Ala Pro Pro Ala Thr Gly Thr  
130 135 140

Lys Cys Leu Ile Ser Gly Trp Gly Asn Thr Ala Ser Ser Gly Ala Asp  
145 150 155 160

Tyr Pro Asp Glu Leu Gln Cys Leu Asp Ala Pro Val Leu Ser Gln Ala  
165 170 175

Lys Cys Glu Ala Ser Tyr Pro Gly Lys Ile Thr Ser Asn Met Phe Cys  
180 185 190

Val Gly Phe Leu Glu Gly Gly Lys Asp Ser Cys Gln Gly Asp Ser Gly  
195 200 205

Gly Pro Val Val Cys Asn Gly Gln Leu Gln Gly Val Val Ser Trp Gly  
210 215 220

Asp Gly Cys Ala Gln Lys Asn Lys Pro Gly Val Tyr Thr Lys Val Tyr  
225 230 235 240

Asn Tyr Val Lys Trp Ile Lys Asn Thr Ile Ala Ala Asn Ser Leu Val  
245 250 255

Pro His Leu Gly Asp Arg Glu Lys Arg Asp Ser Val Cys Pro Gln Gly  
260 265 270

Lys Tyr Ile His Pro Gln Asn Asn Ser Ile Cys Cys Thr Lys Cys His  
275 280 285

Lys Gly Thr Tyr Leu Tyr Asn Asp Cys Pro Gly Pro Gly Gln Asp Thr  
290 295 300

Asp Cys Arg Glu Cys Glu Ser Gly Ser Phe Thr Ala Ser Glu Asn His  
305 310 315 320

Leu Arg His Cys Leu Ser Cys Ser Lys Cys Arg Lys Glu Met Gly Gln  
325 330 335

Val Glu Ile Ser Ser Cys Thr Val Asp Arg Asp Thr Val Cys Gly Cys  
340 345 350

Arg Lys Asn Gln Tyr Arg His Tyr Trp Ser Glu Asn Leu Phe Gln Cys  
355 360 365

Phe Asn Cys Ser Leu Cys Leu Asn Gly Thr Val His Leu Ser Cys Gln  
370 375 380

Glu Lys Gln Asn Thr Val Cys Thr Cys His Ala Gly Phe Phe Leu Arg  
385 390 395 400

Glu Asn Glu Cys Val Ser Cys Ser Asn Cys Lys Lys Ser Leu Glu Cys  
405 410 415

Thr Lys Leu Cys Leu Pro Gln Ile Glu Asn Val Lys Gly Thr Glu Asp  
420 425 430

Ser Gly Thr Thr Arg Gly Gly Pro Glu Gln Lys Leu Ile Ser Glu Glu  
435 440 445

Asp Leu Asn Ser Ala Val Asp His His His His His His  
450 455 460

<210> 42

<211> 464

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: Synthetic  
polypeptide

<400> 42

Met Glu Thr Asp Thr Leu Leu Leu Trp Val Leu Leu Leu Trp Val Pro  
1 5 10 15

Gly Ser Thr Gly Asp Ile Ala Pro Phe Asp Asp Asp Asp Lys Ile Val  
20 25 30

Gly Gly Tyr Asn Cys Glu Glu Asn Ser Val Pro Tyr Gln Val Ser Leu  
35 40 45

Asn Ser Gly Tyr His Phe Cys Gly Gly Ser Leu Ile Asn Glu Gln Trp  
50 55 60

Val Val Ser Ala Gly His Cys Tyr Lys Ser Arg Ile Gln Val Arg Leu  
65 70 75 80

Gly Glu His Asn Ile Glu Val Leu Glu Gly Asn Glu Gln Phe Ile Asn  
85 90 95

Ala Ala Lys Ile Ile Arg His Pro Gln Tyr Asp Arg Lys Thr Leu Asn  
100 105 110

Asn Asp Ile Met Leu Ile Lys Leu Ser Ser Arg Ala Val Ile Asn Ala  
115 120 125

Arg Val Ser Thr Ile Ser Leu Pro Thr Ala Pro Pro Ala Thr Gly Thr  
130 135 140

Lys Cys Leu Ile Ser Gly Trp Gly Asn Thr Ala Ser Ser Gly Ala Asp  
145 150 155 160

Tyr Pro Asp Glu Leu Gln Cys Leu Asp Ala Pro Val Leu Ser Gln Ala  
165 170 175

Lys Cys Glu Ala Ser Tyr Pro Gly Lys Ile Thr Ser Asn Met Phe Cys  
180 185 190

Val Gly Phe Leu Glu Gly Gly Lys Asp Ser Cys Gln Gly Asp Ser Gly  
195 200 205

Gly Pro Val Val Cys Asn Gly Gln Leu Gln Gly Val Val Ser Trp Gly  
210 215 220

Asp Gly Cys Ala Gln Lys Asn Lys Pro Gly Val Tyr Thr Lys Val Tyr  
225 230 235 240

Asn Tyr Val Lys Trp Ile Lys Asn Thr Ile Ala Ala Asn Ser Ala Ala  
245 250 255

Ala Leu Val Pro His Leu Gly Asp Arg Glu Lys Arg Asp Ser Val Cys  
260 265 270

Pro Gln Gly Lys Tyr Ile His Pro Gln Asn Asn Ser Ile Cys Cys Thr  
275 280 285

Lys Cys His Lys Gly Thr Tyr Leu Tyr Asn Asp Cys Pro Gly Pro Gly  
290 295 300

Gln Asp Thr Asp Cys Arg Glu Cys Glu Ser Gly Ser Phe Thr Ala Ser  
305 310 315 320

Glu Asn His Leu Arg His Cys Leu Ser Cys Ser Lys Cys Arg Lys Glu  
325 330 335

Met Gly Gln Val Glu Ile Ser Ser Cys Thr Val Asp Arg Asp Thr Val  
340 345 350

Cys Gly Cys Arg Lys Asn Gln Tyr Arg His Tyr Trp Ser Glu Asn Leu  
355 360 365

Phe Gln Cys Phe Asn Cys Ser Leu Cys Leu Asn Gly Thr Val His Leu  
370 375 380

Ser Cys Gln Glu Lys Gln Asn Thr Val Cys Thr Cys His Ala Gly Phe  
385 390 395 400

Phe Leu Arg Glu Asn Glu Cys Val Ser Cys Ser Asn Cys Lys Lys Ser  
405 410 415

Leu Glu Cys Thr Lys Leu Cys Leu Pro Gln Ile Glu Asn Val Lys Gly  
420 425 430

Thr Glu Asp Ser Gly Thr Thr Arg Gly Gly Pro Glu Gln Lys Leu Ile  
435 440 445

Ser Glu Glu Asp Leu Asn Ser Ala Val Asp His His His His His His  
450 455 460

<210> 43

<211> 485

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: Synthetic  
polypeptide

<400> 43

Met Glu Thr Asp Thr Leu Leu Leu Trp Val Leu Leu Leu Trp Val Pro  
1 5 10 15

Gly Ser Thr Gly Asp Ile Ala Pro Phe Asp Asp Asp Asp Lys Ile Val  
20 25 30

Gly Gly Tyr Asn Cys Glu Glu Asn Ser Val Pro Tyr Gln Val Ser Leu  
35 40 45

Asn Ser Gly Tyr His Phe Cys Gly Gly Ser Leu Ile Asn Glu Gln Trp  
50 55 60

Val Val Ser Ala Gly His Cys Tyr Lys Ser Arg Ile Gln Val Arg Leu  
65 70 75 80

Gly Glu His Asn Ile Glu Val Leu Glu Gly Asn Glu Gln Phe Ile Asn  
85 90 95

Ala Ala Lys Ile Ile Arg His Pro Gln Tyr Asp Arg Lys Thr Leu Asn  
100 105 110

Asn Asp Ile Met Leu Ile Lys Leu Ser Ser Arg Ala Val Ile Asn Ala  
115 120 125

Arg Val Ser Thr Ile Ser Leu Pro Thr Ala Pro Pro Ala Thr Gly Thr  
130 135 140

Lys Cys Leu Ile Ser Gly Trp Gly Asn Thr Ala Ser Ser Gly Ala Asp  
145 150 155 160

Tyr Pro Asp Glu Leu Gln Cys Leu Asp Ala Pro Val Leu Ser Gln Ala  
165 170 175

Lys Cys Glu Ala Ser Tyr Pro Gly Lys Ile Thr Ser Asn Met Phe Cys  
180 185 190

Val Gly Phe Leu Glu Gly Gly Lys Asp Ser Cys Gln Gly Asp Ser Gly  
195 200 205

Gly Pro Val Val Cys Asn Gly Gln Leu Gln Gly Val Val Ser Trp Gly  
210 215 220

Asp Gly Cys Ala Gln Lys Asn Lys Pro Gly Val Tyr Thr Lys Val Tyr  
225 230 235 240

Asn Tyr Val Lys Trp Ile Lys Asn Thr Ile Ala Ala Asn Ser Ala Ala  
245 250 255

Ala Gly Gly Gly Gly Ser Gly Gly Gly Gly Ser Gly Gly Gly Gly Ser  
260 265 270



Gly Gly Gly Gly Ser Arg Leu Val Pro His Leu Gly Asp Arg Glu Lys  
275 280 285

Arg Asp Ser Val Cys Pro Gln Gly Lys Tyr Ile His Pro Gln Asn Asn  
290 295 300

Ser Ile Cys Cys Thr Lys Cys His Lys Gly Thr Tyr Leu Tyr Asn Asp  
305 310 315 320

Cys Pro Gly Pro Gly Gln Asp Thr Asp Cys Arg Glu Cys Glu Ser Gly  
325 330 335

Ser Phe Thr Ala Ser Glu Asn His Leu Arg His Cys Leu Ser Cys Ser  
340 345 350

Lys Cys Arg Lys Glu Met Gly Gln Val Glu Ile Ser Ser Cys Thr Val  
355 360 365

Asp Arg Asp Thr Val Cys Gly Cys Arg Lys Asn Gln Tyr Arg His Tyr  
370 375 380

Trp Ser Glu Asn Leu Phe Gln Cys Phe Asn Cys Ser Leu Cys Leu Asn  
385 390 395 400

Gly Thr Val His Leu Ser Cys Gln Glu Lys Gln Asn Thr Val Cys Thr  
405 410 415

Cys His Ala Gly Phe Phe Leu Arg Glu Asn Glu Cys Val Ser Cys Ser  
420 425 430

Asn Cys Lys Lys Ser Leu Glu Cys Thr Lys Leu Cys Leu Pro Gln Ile  
435 440 445

Glu Asn Val Lys Gly Thr Glu Asp Ser Gly Thr Thr Arg Gly Gly Pro  
450 455 460

Glu Gln Lys Leu Ile Ser Glu Glu Asp Leu Asn Ser Ala Val Asp His  
465 470 475 480

His His His His His  
485

<211> 239

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: Synthetic  
polypeptide

<400> 44

Met Glu Thr Asp Thr Leu Leu Leu Trp Val Leu Leu Leu Trp Val Pro  
1 5 10 15

Gly Ser Thr Gly Asp Ala Ala Gln Pro Ala Arg Arg Ala Val Arg Ser  
20 25 30

Leu Val Pro His Leu Gly Asp Arg Glu Lys Arg Asp Ser Val Cys Pro  
35 40 45

Gln Gly Lys Tyr Ile His Pro Gln Asn Asn Ser Ile Cys Cys Thr Lys  
50 55 60

Cys His Lys Gly Thr Tyr Leu Tyr Asn Asp Cys Pro Gly Pro Gly Gln  
65 70 75 80

Asp Thr Asp Cys Arg Glu Cys Glu Ser Gly Ser Phe Thr Ala Ser Glu  
85 90 95

Asn His Leu Arg His Cys Leu Ser Cys Ser Lys Cys Arg Lys Glu Met  
100 105 110

Gly Gln Val Glu Ile Ser Ser Cys Thr Val Asp Arg Asp Thr Val Cys  
115 120 125

Gly Cys Arg Lys Asn Gln Tyr Arg His Tyr Trp Ser Glu Asn Leu Phe  
130 135 140

Gln Cys Phe Asn Cys Ser Leu Cys Leu Asn Gly Thr Val His Leu Ser  
145 150 155 160

Cys Gln Glu Lys Gln Asn Thr Val Cys Thr Cys His Ala Gly Phe Phe  
165 170 175

Leu Arg Glu Asn Glu Cys Val Ser Cys Ser Asn Cys Lys Lys Ser Leu  
180 185 190

Glu Cys Thr Lys Leu Cys Leu Pro Gln Ile Glu Asn Val Lys Gly Thr  
195 200 205

Glu Asp Ser Gly Thr Thr Arg Gly Gly Pro Glu Gln Lys Leu Ile Ser  
210 215 220

Glu Glu Asp Leu Asn Ser Ala Val Asp His His His His His His  
225 230 235

<210> 45

<211> 8

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: Synthetic  
peptide

<400> 45

Arg Pro Leu Ala Leu Trp Arg Ser  
1 5